RELEASE 1.0

6-99 *ESTHER DYSON'S MONTHLY REPORT* **18 JUNE 1999**

LIVING ON THE WEB: THE RISE OF POST-GROUPWARE
By Kevin Werbach

Ralph Ellison told anyone who asked about the sequel to his celebrated novel Invisible Man that he was "working on the transitions." At his death in 1994, the manuscript he had been laboring over for 40 years was nowhere near completion. Ellison's remark may have been simply a bit of ironic misdirection, but it bears consideration. Where does the meat of the story end and the transition begin? In the world of literature this question often has no answer, because there are no absolute boundaries between different parts of a work.

In the world of technology, by contrast, we are used to separating things and differentiating applications from what flows between them. That certainty is beginning to evaporate. In a networked world the transitions often matter most, because value lies in moving (the right) information from where it is to wherever it's most needed. Users have no idea how something got to their screen, because the Net magically collapses time, space and physical infrastructure.

The atomic unit of software has always been the application. Efforts to uncover subatomic components and free-floating scripting and messaging platforms have made limited headway. The Net has begun to change the definition of an application, and it has also opened up the possibility of new kinds of services that derive value from, dare we say, the transitions. These new Net applications are most evident in the emerging post-groupware space of collaboration and communication tools: file delivery, contact management, unified messaging and synchronization.

How do you manage your life? In our complex, fragmented world, human memory alone is an increasingly poor tool. The software industry long ago picked up where paper calendars and organizers left off, offering personal information managers (PIMs) and comprehensive groupware suites to help professionals collaborate and keep track of their activities. All these tools are now sprouting Web-based front ends, but they are also facing competition from a new array of services (rather than static applications) that are available only through the Net. =====>

INSIDE

LIVING ON THE WEB 1
Net applications.
BOX: CALENDARING STANDARDS 4
FILE STORAGE AND DELIVERY 5
docSpace.
click2send.
MAKING INFORMATION FLUID 8
HotData.
Onebox.
SYNCHRONIZATION 10
FusionOne.
PlusFactor.
BOX: WEB-BASED SCHEDULING 13
TimeDance.
WHAT IT ALL MEANS 14
Static to dynamic.
RESOURCES AND CALENDAR 18
Names, phones, dates, URLs.

WELCOME JOANNA!

These new services differ in important ways from their desktop or LAN-based counterparts. There's also something at work here that the concept of outsourcing and the old time-sharing models don't capture. The market research houses will dream up a snazzy tagline for this emerging category, but for now we'll call it post-groupware.

Put simply, these Net applications[1] herald a new form of computing: distributed, multi-user, fluid and customer-centric. They are function-oriented and componentized, in contrast to the monolithic kitchen-sink applications of the past. They allow the user to think in terms of roles in the physical world, rather than worry about the constraints of particular technological environments. They will initially be built using proprietary data translators, but eventually will foster standards that allow information sharing across traditional corporate or workgroup boundaries. Their purpose is to get the right information to the right people at the right time and place...in a constantly-shifting environment.

We'll get to this new model in fits and starts, because this is uncharted territory and we don't even have the vocabulary to describe it. To take a simple example, what is Yahoo!? A massive client-server application whose clients happen to be Web browsers? A multi-author catalogue? A customized Oracle database? Many different applications tied together with scripting languages? An online service? A storehouse of content with dynamic delivery interfaces? A Website? An operating system? Saying it's a portal gives no indication of internal structure, but any more concrete label seems incongruous on some level.

Such questions without answers matter because these new Net applications manifest themselves in novel ways, and looking at them through traditional lenses obscures their potential.

This is your life

With change accelerating and the cost of communications and transportation dropping, managing one's life is becoming increasingly complicated. There are plenty of tools to help people in this task. Paper calendars and address books have given way to organizers from companies such as DayTimer, Filofax and Franklin Covey. Software packages such as Notes and Outlook/Exchange take those organizer functions and put them in electronic form. Checkbooks and ledgers have given way to Quicken and Excel.

Like every other facet of software, these personal information platforms are moving online. If yesterday you ran your life on a paper organizer and today you do it through local software applications, then tomorrow you will live on the Web, coordinating your life with your counterparts'. The first elements of this shift are in new devices such as the Palm that extend PC-based applications such as scheduling, addresses and note-taking. The Palm has been successful partly because its designers didn't go too far too fast; they correctly assumed that most users would run their lives on a PC and would therefore want a personal digital assistant (PDA) with simple synchronization capabilities. Web-based e-mail services are similarly limited in ambition: Most people use them as alternate accounts (for

[1] These services generally use the Web as a primary interface, but they can be delivered over the Net through other mechanisms as well.

example, to receive private personal messages at the office) or as a means of gaining access from remote locations without dialing into a local ISP.

At some point, though, the PC will no longer be the unchallenged center of each person's world. Most people may still depend on PCs as their primary computing device, but they won't necessarily think of the PC as the central repository of information. Data will reside in the network, wherever that may be. Users won't necessarily think about it that way because they will always view the information somewhere and they won't need to think much about how the information gets from place to place. And as a practical matter the data won't necessarily all be stored in some central server; it may be stored locally but kept in sync and moved around through network-based services.

Net application services will not necessarily mirror traditional desktop applications. Some things work just fine locally. Even if you could deliver a word processor over the network, it's not clear why you would want to. Application service providers (ASPs) such as USinternetworking and Corio are taking enterprise apps from vendors such as Siebel, PeopleSoft and BroadVision and renting them over the Net to small and medium businesses; this approach may work, but it's a transitional strategy until the applications themselves evolve.

We're seeing something similar in the consumer market. The first rush towards Web-based applications simply took things people used on their PCs and delivered them over the Net through a browser interface. Hotmail and the slew of other Web-based e-mail services began this charge, and since then we've seen numerous companies offering Web-based calendars (WebCal, When.com, Amplitude, AnyDay, eCal, SuperCalendar, Day-Timer, etc.), file backup (@Backup, Atrieva) and groupware suites (Visto, Jump, MagicalDesk). This space is young but is consolidating rapidly: already this year AOL bought When.com and Microsoft acquired Jump, following Yahoo!'s purchase of WebCal last year.

Taking an existing desktop product category and putting it on the Web can certainly attract customers. Hotmail, for example, has over 40 million users. This approach can form the basis for a real business...or augment someone else's. However, these services are just the beginning.

New applications for a Net-centric world

The Net makes it possible to sell services that would not be viable on the desktop. A desktop application must offer a function not already available in the OS (or much more powerful than the built-in version), and must provide enough value to justify a price that includes marketing, packaging, customer support and so forth. The app must also match up with a particular desktop OS and hardware configuration. Ten-dollar shrink-wrapped software doesn't exist because the economics of distribution don't support it.

On the Net these dynamics change. Web-based services, even ones already available on the desktop, may offer additional value to users such as automatic backup, accessibility from multiple machines and integration with outside content and other people. Moreover, Net applications can avail themselves of techniques and business models that don't exist on the

desktop, such as banner advertising and affiliate marketing, to bring the nominal price of the service down or even to zero. Even services with no standalone revenue sources, such as ICQ, may prove viable as part of a larger company's offerings, because many services can be bundled together or marketed across a common customer base.

Calendaring standards

An important element of the emerging Net-enabled world is the ability to exchange information between users and sites. The Internet Engineering Task Force (IETF) has developed several standards for exchanging calendaring and scheduling information, although not all of them are finalized yet.

The Versit consortium, founded by Apple, IBM, AT&T and Siemens, developed the vCard and vCalendar standards for business card and scheduling information, before disbanding in 1996. The IETF took over work on vCalendar and evolved it into the iCalendar (or iCal) standard, which provides the basic model for representing calendar data. iTIP (iCal Transport Independent Interoperability Protocol) and two related standards allow calendar systems to exchange information with one another. These standards have gone through the IETF process, but there is a crucial unfinished piece: the Calendar Access Protocol (CAP).

CAP will allow mixing and matching of calendar information between different clients and servers. Once widely implemented, it will allow companies and Web-based services to operate centralized calendar back-ends, without requiring users to run particular client software. The IETF's calendaring and scheduling group is currently working to resolve the remaining issues with the CAP standard, and hopes to have a draft for submission to the standards approval process in July.

It takes several different functions to organize your personal and professional lives. (For one vision of a "fridge door" platform for Web-based family interactions, see Release 1.0, 11-97.) When we think about PIMs and similar applications, we generally focus on the content (e-mail, word processing documents, phone numbers, etc.) and the purpose of information. But how does the information get there in the first place? In an unconnected world, the answer is easy: If you want some data to support your applications, you need to either enter it yourself or bring it over on disk in the proper format via sneakernet. Today most computers are networked, which automates moving information from place to place, but feeding content into them can still be cumbersome and inflexible.

What is needed, and what Net applications will provide, are frameworks for moving data around and making information available when you need it, how you need it. Architecturally, that means shifting from one-to-one, peer-to-peer systems to distributed, server-based, componentized approaches. Peer-to-peer may sound more politically correct, but server-based approaches (augmented in some cases with client-side software) provide much more reliable access to data and functions. We point to some specific examples below, followed by a general discussion (see page 14) of how the industry is likely to evolve.

FILE STORAGE AND DELIVERY

The Net application model is most fully implemented today in the seemingly humble area of file storage and delivery. This space is a classic example of a market that wouldn't exist without the Net, but that could emerge as a significant and valuable intermediation point as users increasingly depend on Net-based collaboration.

We all know how important the falling price of hard drives and CD-ROMs has been to the PC industry, as applications ceaselessly balloon in size and users carelessly accumulate data. With the continual sedimentary deposit of data in enterprises, massive storage is essential, generating significant revenues for vendors such as EMC and Network Appliance as well as caching vendors.

We don't usually think about file storage as a software-based service; it's something we look at as hardware. That's the case partly because we take for granted the software and networking functions needed to retrieve information from a storage device. But the same infrastructure can support multiple business models, if there's a way to deliver different services that users value. The same wireless phone can be free with a long-term service contract, subsidized as an incentive to buy service, or offered at full retail with the service on an ‡ la carte basis. The phone itself may not be shared across more than one user, but the wireless network is.

In a networked environment, file storage is directly related to file delivery. The Net has two primary mechanisms for transmitting files to and from remote locations: ftp and e-mail attachments. Ftp was designed for file transfers, but it is cumbersome to use, has limited security and has no built-in management tools for notifying senders or potential receivers of documents. E-mail, using the Multipurpose Internet Mail Extensions (MIME) standard, serves as the de facto transfer mechanism for documents today because unlike ftp (fetch-only) it allows senders to push information to receivers. MIME, however, isn't secure (most current clients don't support S/MIME, a version with security features). More important, senders have no way of knowing whether a message reached its destination, and many corporate and ISP networks have gateways that limit the size or contents of file attachments.

Federal Express prospered even though the US Postal Service and UPS already offered package delivery, because it provided added value — guaranteed overnight delivery and tracking — not previously available. As electronic documents become increasingly mission-critical, there is an opportunity for Fedex-like services that offer additional functionality over sending files as e-mail attachments. Standards such as S/MIME may help, but they can't get around the fact that e-mail was designed for communication rather than document delivery. Moreover, once users begin to use Web-based services to store and distribute files, it will become possible for providers to offer them other features and services.

The two companies most committed to this vision are docSpace and click2send. Both offer Web-based solutions not requiring any client software, and both offer free consumer services while targeting businesses as their primary customer market. docSpace touts the variety of services it can deliver on top of its core platform, while click2send has

concentrated initially on making its core file delivery service as robust and easy-to-use as possible.

docSpace: The Switzerland of file services

The docSpace Company was spun out of Canadian ISP Cyberion Networking in December 1997, and subsequently relocated to Menlo Park, CA. Ceo Evan Chrapko was previously president of CEL Corporation, a Canadian vendor of enterprise middleware.

docSpace has developed a sophisticated platform for Web-based document storage and delivery. Chrapko says that because of the company's ISP heritage, "our guiding principle is that as the party in the middle, we're the Switzerland of file services." Rather than build a simple file delivery service, docSpace designed a complete architecture to manage files in a Net-based "document space." The system generates metadata around files to support a wide range of services including encryption, workflow, versioning, file translation, auditing, virus scanning and digital signatures. docSpace recently filed for a patent on its core architecture.

docSpace currently offers three services, with a fourth under development. docSpace Drive functions as a remote hard drive. Users upload and download files from their local system to the docSpace servers via a browser interface. This is useful for additional file space, but with hard drives cheap the primary benefit is for mobile users who need to get at files from a variety of devices (home and office PCs, laptops, etc.). docSpace Direct is a drop-box for companies that need to process file submissions to a central location. docSpace Express offers file distribution and tracking features. Once a file is uploaded to the docSpace server, customers can send e-mail notification to recipients, who receive a URL that allows them to download the file. This fall docSpace plans to introduce a manager application that includes versioning and workflow capabilities for companies that want to collaborate on network-stored documents.

All Express file transfers are protected with secure sockets layer (SSL) security; senders can also password-protect files or can use built-in public-key encryption (docSpace automatically stores a private key for each registered user).

The services are offered with several different pricing plans. A free consumer option is limited to five megabytes for Express and 20 megabytes for Drive; premium accounts starting at $10 per month offer additional storage space, duration and deliveries. docSpace's primary market, however, is enterprises to whom it sells on a subscription basis. Its flagship corporate client is Ogilvy & Mather, which uses docSpace's software to manage file distribution across its 26,000 employees and clients. For large users, docSpace also sells a management service to track usage.

docSpace is looking to partner with ISPs, portals and other sites that can serve as distribution channels for its services. The company currently offers Express and Drive accounts through Microsoft's Australian and British MSN portals (but not the main msn.com site yet).

On March 25, Tumbleweed Software sued docSpace for patent infringement. Tumbleweed, which offers a proprietary online document delivery platform to businesses, received a patent in 1998 for document delivery with e-mail notification to recipients. docSpace is aggressively contesting the suit, and Tumbleweed recently withdrew its request for a preliminary injunction, although the infringement action is still pending.

click2send: The name says it all

click2send, based in Mountain View, CA, was founded in 1998 by ceo Charlene Steele Vaughn and cto David Knight. Vaughn was a founder of Time Warner Interactive and was president/ceo of Chuck Jones Studio Productions; Knight was previously involved with networking companies Retix and Isocore and was active in the development of various messaging standards. The company has about 30 employees and has so far been funded primarily by angel investors including former CS First Boston managing director Scott Smith, Good Guys ceo Ronald Unkefer and Mesa Research Group chairman William Davidson.

Vaughn and Knight believe network-based file management will be a crucial element of hosted applications, but delivering reliable performance at scale is harder than it looks. The company has focused from the beginning on supporting millions of users, which means bringing together large amounts of managed bandwidth and storage space along with robust security. Recently, Cisco chose click2send as one of the initial participants in its hosted application initiative.

click2send believes ease-of-use is paramount. The click2send home page is dominated by two large icons labeled “deposit a file” and “pick up a file,” and even the company name was chosen to avoid any confusion about what the service does. Registered users can create multiple “safe deposit boxes” for different kinds of files, each of which can be individually password-protected, and then can send e-mail notifications to recipients.

click2send’s basic service is available for free and provides users with up to five boxes holding 120 megabytes of disk space each. click2send plans to generate revenues from ad banners on its site, co-marketing through sponsorship deals with various partners, and fee-based premium services sold on a monthly per-seat basis to corporations. Like docSpace, click2send intends to offer its service through a large number of distribution partners, just as private-label Web-based e-mail has become nearly ubiquitous on major sites.

Knight believes there is significant pent-up demand for a service such as click2send. More and more people are using e-mail attachments to send large files, but the limitations of that method are increasingly apparent. Corporate firewalls are often set to reject attachments over a certain size to avoid clogging internal networks or to prevent security breaches such as the recent Worm.ExploreZip outbreak involving executable attachments. Many business users today simply don’t use the Net for important documents because e-mail attachments are such a hassle.

Yet the alternatives, such as fax and Fedex, are expensive for what is, after all, just moving bits from place to place asynchronously. Once people start thinking of Web-based file distribution as an option, they will find countless uses for it, so long as providers such as click2send

can make the service sufficiently easy and the customers have enough bandwidth. For example, one early customer was a radiologist who operated several clinics and needed to move X-rays around if a patient showed up at a different office.

In the future, click2send plans to provide a variety of additional features and services such as archiving, format conversion, version control and digital signatures.

MAKING INFORMATION FLUID

The next step beyond delivering files through a Net application is to manipulate shared information in new ways the Net makes possible. Current collaborative applications such as groupware, sales-force automation and e-mail systems help users organize and manage interactive functions, but their underlying data richness tends to be limited. In a Net-based world, possible functions such as scheduling meetings, deciding on sales strategies or communicating with colleagues in a structured way (workflow) require more than simply returning content from a static pool.

The Net can break down the boundaries between applications — such as voice mail, e-mail, fax and paging in the case of Onebox below — to allow users to concentrate on what matters to them.

HotData: Making the most of information

HotData, based in Austin, TX, is a spinoff of development tools vendor Rogue Wave Software with funding from TL Ventures and El Dorado Ventures. Vp of marketing Byron Reese developed the idea for HotData in 1996 while at Rogue Wave; ceo Johnny Anderson, who came on board in February, was formerly ceo of marketing automation provider e2 Software.

Information services vendors such as Acxiom have developed several-hundred-million-dollar businesses aggregating and selling customer lists and providing data-cleaning and overlay services. Individual companies all have customer databases, but they typically don’t have access to the same tools and information sources as these providers and their large customers. HotData has aggregated a set of partnerships, Web-based systems and software tools to level the playing field for smaller businesses.

“While we’re Internet-based, we’re not Web-centric,” says Anderson, explaining that HotData leverages the Web to enhance existing desktop and client-server packages, rather than forcing users to switch to Web-based front-ends. HotData’s system can extend to virtually any local application that depends on external data, and can also support Web-based services, but the company is initially focusing on sales-force automation (SFA) and contact management tools such as ACT!, GoldMine and Outlook. HotData offers plug-ins for several major packages and has OEM relationships with a number of other application vendors. With HotData, users see a special button in their application that automatically connects to the HotData servers and populates records with additional information drawn from sources such as Acxiom, Dun & Bradstreet, Experian, Claritas, Polk, Westminster International, Infospace and the US Postal Service.

For example, a sales rep looking at a prospect's contact record can automatically see information on sales volume and number of employees at the prospect's company. This public information is layered on top of the existing local data, so the sales rep can still manually note the CIOís birthday and her dog, and the companyís plan to open an office in Copenhagen next fall. HotData's system also corrects and standardizes addresses and phone numbers, cross-checking information from multiple sources to ensure accuracy and updating out-of-date addresses when people move. Users can update information either on a record-by-record basis, or can use batch-mode processing to clean and augment an entire contact list. When the system can't match a record reliably, it can allow users to choose among best-guess matches.

HotData's service launches June 21. Pricing starts at $19 per month and goes up depending on the size of the database the customer wishes to link into the system. HotData generally pays its information providers on a per-transaction basis, but Anderson says customers strongly prefer flat-rated pricing. HotData's approach gives small businesses access to services they could not otherwise afford, while allowing high-end information providers to expand their markets. Even though the absolute end-user prices are lower than the information providers charge directly, the per-record rates wind up being the same or greater due to the much smaller databases involved.

After establishing itself in the low-end SFA space, HotData plans to build connectors for other customer-oriented applications. "Any kind of application that uses customer-centric data is on our radar," Anderson says. The system's architecture, building on Rogue Wave's expertise in development tools, makes it easy to plug in different types of data objects on the same transmission and reconciliation platform.

Onebox: Unifying messaging through the Web

Onebox.com, headquartered in San Mateo, CA, was founded in May 1998 by serial entrepreneurs Bill Nguyen and Siva Kumar. Nguyen, who most recently was vp of content and business development at wireless content delivery service WavePhore, is Onebox's vp of business development. Kumar, who serves as chairman, also founded Impresse and CallNet Communications. The co-founders recruited president and ceo Ross Bott after his departure from Adobe, where he was evp responsible for all of Adobe's products. Onebox has raised $20 million from investors including Institutional Venture Partners, Brentwood and ZDNet (which will also distribute the service).

Onebox offers a Web-based unified messaging service, with the basic version available for free. Users receive a personal local dial-in number for their callers, initially available in New Jersey, Austin and Northern California, with coverage in most major US cities by the end of the year. Rather than use toll-free numbers or separate local numbers for every user, Onebox adds a four digit extension to the local number. Using this approach, for which Onebox has filed a patent application, one number can serve up to 10,000 customers, greatly reducing infrastructure costs.

Onebox detects whether incoming calls are voice or fax, and converts voice messages into audio files and streams them over the Internet to Onebox's server farm. Customers of the service can receive these voice and fax

messages alongside their e-mail in a unified inbox, either through Onebox's Website or through an existing e-mail account. The voice messages play back as streaming audio files without any additional software, and can be forwarded or saved on the system just like e-mail. The service can also use ICQ to alert customers of new messages.

Nguyen and Bott avoid labeling their solution as unified messaging, because so many unified-messaging services have failed to take off. Still, they acknowledge the history of the space and say Onebox will be different. "Most of the services today are very much focused on the telephone as the primary interface," Nguyen explains. "We made the center of our network the IP infrastructure, and allowed that to interface with everything else." Because Onebox is Internet-centric, it doesn't lock users into a particular messaging platform. Nguyen also feels that existing unified-messaging solutions bit off too much, incorporating complex features such as text-to-speech conversion that add little value for most users. Most of the other services target high-end mobile professionals; Onebox sees a much larger consumer market for an easy-to-use free service.

Onebox requires no client software other than a browser, and its user interface mirrors the now-familiar Web-based e-mail services. Because of its low-cost, IP-centric architecture, Onebox is able to add additional features relatively easily. For example, Onebox can automatically generate an address book from incoming and outgoing e-mail. Nguyen says the company plans to extend its platform to other functions such as calendaring in the near future.

In addition to its free offering, Onebox will provide premium services for a fee starting around the end of this year. Potential premium features include toll-free access and forwarding from an existing phone number to the Onebox system. Onebox will offer services that mirror existing central office voice-mail offerings from local phone companies, but at a much lower price point.

GETTING IN SYNC

Synchronization is the missing enabler for universal Net information platforms. Synchronization software has been around for some time, typically to allow users to move information back and forth between a desktop and portable computer, updating one side or the other seamlessly. Palm's one-button HotSync software was a critical element in the success of its devices, but because it was bundled with the device it also slowed the development of third-party solutions. Only one company, Puma Technology, offered an add-on synchronization solution, which succeeded by allowing users to synchronize with software packages not supported by HotSync. (Microsoft now bundles synchronization software called ActiveSync with Windows CE handhelds.)

HotSync and Puma's Intellisync may be sufficient solutions for the narrow problem of synchronizing e-mail, scheduling and contact information between a handheld and a desktop computer. However, this is only a special case of a broader issue: the need to manage changing information in an increasingly distributed environment. Philippe Kahn's Starfish Software developed a more open-ended synchronization engine with its TrueSync technology, which

is designed to allow applications on several devices (for example, a PC, a Pilot and a Web-based calendar) to stay in sync. However, the system still operates in peer-to-peer mode requiring direct connections between all devices. Given Motorola's acquisition of Starfish in July 1998 for approximately $400 million, it also seems likely that the company will focus more on wireless applications rather than a comprehensive synchronization platform.

Startups FusionOne and PlusFactor represent the next generation in synchronization. FusionOne focuses on synchronizing multiple devices for a single user, while PlusFactor coordinates many users of a single type of device (the Palm). However, the underlying architectures of the services are similar. Both use a combination of network-based servers and client-side applications to reconcile information across multiple devices. PlusFactor provides deeper functionality for specific tasks in its client software, whereas FusionOne can synchronize a broader range of apps.

FusionOne: Universal synchronization

FusionOne, based in Los Gatos, CA, is the first company to build a distributed any-to-any synchronization service. Ceo Rick Onyon, formerly vp of sales and marketing with networked storage and caching vendor MangoSoft, says he recognized the need for such a product from his own experience as a mobile professional.

Onyon believes current synchronization products are far too limited. "Sync needs to be as ubiquitous as e-mail," he says. "Thanks to the explosion of new Internet access devices," he continues, "people will become comfortable with the notion of getting information from anywhere," rather than carrying a laptop computer everywhere they go. Making good on that promise, however, requires a scalable server-based system to reconcile and distribute information.

FusionOne's architecture is a hybrid of centralized and peer-to-peer approaches. The company provides proprietary client software for each device a user wishes to synchronize. Windows PCs and Palm devices are supported today, with Macintosh, Windows CE and wireless access protocol versions (see Release 1.0, 4-99) expected later this year. When a user goes online or manually initiates a sync, the client extracts, compresses and sends new or changed information to FusionOne's remote servers, where it is stored in an encrypted meta-format accessible by ftp. The server also updates the client with any new data from other devices. Although the information is stored centrally, the actual reconciliation takes place at the client. User data are encrypted on the server for security, and maintaining everything remotely also means the system automatically provides a secure backup in case a device crashes or is lost.

This transaction-based approach is more flexible and scalable than a purely peer-to-peer system. Because information is stored in the network, users can update whatever device they are working on rather than having to synchronize all clients simultaneously. The server can also push new application connectors down to a client automatically, because every time a user syncs it checks the client against a current list. Unlike purely network-based systems, however, FusionOne does not require the central server to understand the local formats of every client device.

FusionOne stores information in generic formats (for example, contacts or e-mail messages), and allows the individual devices to convert it into a specific application format. A user may have an office PC with Outlook, a Palm device, a home machine with Netscape Communicator and a wireless phone with a built-in address list. Using FusionOne, she could automatically keep her contact information in sync across all these platforms. Even if FusionOne's client software doesn't have an interpreter for a particular application, it can often still keep information in sync between two devices running that app, because it can compare and synchronize binary data files.

FusionOne can also synchronize other types of information such as Web browser bookmark lists and cookies (the small files that allow users to log into Websites without typing passwords each time, and also maintain data on the user for advertisers and others). The system is configurable if users don't wish to have any types of information synchronized.

FusionOne also operates a Website called eDock. Customers can log into the site securely to view their information (e-mail, calendar, contacts, tasks and files) directly. Any changes made on the eDock Website are automatically synchronized to all devices when they connect.

FusionOne is announcing its product this month and plans general availability in August. Its initial service will be free for non-commercial users, supported by banner ads on the Windows client. The company will also offer a $39.95 premium version that allows commercial use, nixes the banner ads and doesn't require users to manually initiate the synchronization each time. FusionOne plans to offer the commercial service through ISPs and Web-hosting providers, who can offer it to their customers as a value-added service. Onyon expects that these partners will use a variety of pricing plans depending on the amount of storage, degree of security and other features they offer.

FusionOne has 20 employees and seed funding from El Dorado Ventures; Onyon expects to close another funding round this month and to expand to more than 50 employees by year's end.

PlusFactor: Syncing across communities

Net applications, being distributed by nature, can span more than one user. Groupware systems on corporate LANs allow users to share information, for example to schedule a meeting for several employees. These systems break down, however, if everyone isn't on the same platform. They also don't take full advantage of PDAs such as the Palm, which are now the primary calendar interface for millions of people. Though Palm devices have built-in applications including scheduling and synchronization, these have been designed for individual users rather than communities.

PlusFactor software, a startup in Portland, OR, is launching a service called WeSync this month that addresses this limitation. The company was founded in 1997 by president Pete Grillo, who previously worked on network management projects at Intel's architecture labs. Grillo says the company originally developed a suite of Java-based intranet scheduling applications, but quickly discovered that what users really wanted was group

calendaring on their Palm devices. So PlusFactor took its core architecture for multi-user event management and turned it into WeSync, which allows handheld users to manage information across their personal life, work life and interests.

Coming next: Web-based scheduling

The next post-groupware category will likely be Web-based scheduling services. Calendaring and scheduling are often conflated, but in reality, group scheduling represents the *intersection* between personal calendars of multiple participants. Many of the Web-based calendars offer group scheduling, but all the participants must typically subscribe to the same service. PlusFactor (see page 12) can handle group meetings, but the service simply lists the proposed meeting on every person's handheld and makes no attempt to coordinate calendars.

If Al wants to schedule a meeting with Ethel, all he cares about is finding an open time on her calendar. Web-based group scheduling offers unique value because it allows individuals to manage their lives however they wish, while still being able to coordinate meeting times with others.

One of the first companies to focus on this opportunity is TimeDance, a startup based in Redwood City, CA and funded by Institutional Venture Partners and Mayfield Fund. The free service is now in public beta at www.timedance.com. TimeDance offers a Web-based interface for users to identify open times and list e-mail addresses of meeting participants. TimeDance manages the process of coordinating meeting times by e-mail, sending requests and confirmation to the participants as needed. Once a time is selected, participants can click on a link to import an embedded iCal object (see page 4) into their personal calendars.

TimeDance plans to introduce full two-way synchronization with popular desktop PIMs in the near future. Synchronization and, ultimately, widespread implementation of the IETF's calendar interchange standards will offer users the best of both worlds: freedom to schedule meetings regardless of what calendaring systems participants use, without giving up the benefits of your own package or service.

WeSync uses a Palm application that replaces the device's built-in calendar. PlusFactor's team believes strongly in the Palm's simple, easy-to-use aesthetic, so the WeSync apps are designed to resemble the built-in software (which the company licensed from 3Com) as much as possible. Grillo's mantra is: "Don't force the Palm user to perform any unnatural act." WeSync simply allows users to add group calendars and contact lists to their existing single-user ones, and to control what information is visible to the group versus kept private. Using the platform, communities or business organizations can schedule meetings or share appointments, and users can subscribe to information channels listing events of interest to a particular community.

PlusFactor will operate a WeSync Website where users can find public events and contacts to download, or communities with which they share interests.

Grillo suggests other uses such as distributing up-to-date phone numbers for airlines and rental-agencies or local numbers for ISPs, which Palm users today must generally enter by hand. Customers can manage their own profile information through either a desktop application that works with major PIMs such as Outlook and Notes, or through a Web-based interface.

Underneath these applications lies a general platform for device-to-device synchronization. "Our database doesn't know a calendar from a contact," says Grillo. PlusFactor eventually plans to build handheld synchronization support for outsourced enterprise applications such as sales-force automation, human resources and enterprise resource planning.

Later this year PlusFactor plans to add additional security and management functions for corporate users, and also to offer support for the Palm VII's wireless connectivity (see Release 1.0, 4-99). Windows CE support is under development for release early next year, and PlusFactor also plans to support other handheld devices such as wireless phones in the future.

WHAT IS ALL MEANS

From static to dynamic

There are actually two shifts taking place here: from local to remote and from products to services. The two are related but distinct. These days users' information increasingly resides on a server and is called up as needed through a standard browser interface, rather than being stored on the client machine. That's what most people think about when they consider hosted services. But equally important is the delivery model, which is fundamentally dynamic and user-centric.

Applications are static, on many levels. They come in boxes with defined feature sets, interfaces, versions, and bugs. Once you pay for the app it's yours...at least until it's time to upgrade. It may take time to get used to the idiosyncrasies of a product, but over time you adapt to it.

Not that the boxed model of software necessarily reflects reality. The dirty little secret of most enterprise applications is that the majority of the customer cost comes in the form of "installation and implementation services" such as customization, data conversion, upgrades and training. But the idea is still that there is a core product at the center that, once in place, will remain stable.

As functions move into the network, however, things change. Part of the value of a hosted service is that it isn't static. It can adapt to your needs, rather than vice versa, because you're paying for functionality rather than a stack of code. You pay on an ongoing basis, which means that the total price may be higher than for packaged software, although the initial cost is far lower and you get more for your money. A Net application is constantly changing, because it must serve an increasing number of customers whose needs evolve over time. In physical terms, it resides on server clusters distributed across dedicated hosting facilities, interfacing with various Net protocols and infrastructure as needed. Just as humans replace every molecule in their bodies during a lifetime but

retain physical integrity, the Net application changes steadily though seemingly remaining the same.

The distinction between desktop apps and hosted services mirrors that between PCs and information appliances (see Release 1.0, 4-99). The PC does many many things, but as a result it is expensive and complicated to use. Information appliances, by contrast, do one or a few things but do them extremely well. Information appliances are generally defined by their function: They are what they do. That inherently makes them simpler to use, because users need not understand both the task and the general-purpose set of interfaces applied to that task.

Market dynamics

For the Net application model to take off, the new distributed services must offer some appreciable value, since the default will be for users to stick with their traditional desktop products. Value may take the form of lower prices...or more likely of greater perceived functionality, at the same price or worth paying more for. This will be a gradual transition, rather than a flash cut in which users trash Microsoft Office for a hosted version of the same (although both Microsoft and Corel are moving in the direction of offering network-based functionality and rentable applications). HotData, for example, shows how the Net can supplement, rather than supplant, traditional local applications. As applications increasingly use modular code, it will be possible to update functions and add features over the network, even if the customer buys a boxed application at the outset.

All this means that there is an imperative for service providers to touch the customer, and to touch as many of them as they can. Successful Net-based businesses experience economies of scale, and not simply because of the familiar positive externalities of networks. The value to users of a networked service rises geometrically with growth in network nodes, but costs go up in linear fashion or even slower. The hardware infrastructure of Net applications involves significant up-front fixed costs for servers, storage and bandwidth, but those costs can be shared across an increasing base of users (and through a third-party hosting provider, the costs can be further shared across many applications).

The confusing part is that users are all unique, and when given the freedom to organize their lives as they please they won’t all do things the same way. Desktop applications force users into a particular pattern, and even when you add in Web-based services and new devices such as handhelds and smart wireless phones, there is still a predictable pattern to each environment. Moving from Notes on a LAN to synchronizing Notes with the Palm calendar application and Jump’s Web-based calendar service may make a user better off, but the user still must maintain three discrete applications. With Net applications, however, there is increasingly no there there...or there is everywhere! You may still be running the same software on various devices, but each platform is simply a window and what really matters is what you are trying to accomplish at a particular moment.

In a networked world, users will think in terms of functions rather than worry about location: What tools do I need? What platform? What information do I want? Physical factors such as screen size and connection

speed will of course constrain what someone can see at any given moment. But an appointment is an appointment, wherever it is stored and however I am notified that I need to be somewhere.

Consequently, services that offer dollops of functionality may be more successful than all-encompassing solutions. Services such as file delivery and data integration provide clear, straightforward value propositions, and because they are so limited they can be offered cheaply and simply without requiring significant user behavior changes. Free Web-based e-mail is the clearest example; it costs nothing for users and is completely disposable. Customers are willing to try out the new service on a whim, because they can always just stop using it with little or nothing lost.

All-in-one Net applications such as Visto, HotOffice and MagicalDesk have a higher bar to meet: They offer more but require more of the user. These services may be very successful if they find a niche (such as mobile professionals) willing to pay for the richer functionality they offer, and willing to run their lives on the new systems. But the majority of users, we believe, will move their lives to the Web piecemeal, without entirely realizing what's happening.

The pieces fall into place

There are many other necessary factors for the rise of Net applications. Most of these new services involve sending files frequently between several network endpoints, which requires bandwidth and, ideally, always-on connectivity everywhere. Ubiquitous broadband isn't a prerequisite for these services to begin operation, and the first-generation Net applications have generally been designed to survive in a dial-up environment. However, the full promise of the model won't be realized until the connectivity is there to support it.

Furthermore, the fluidity we're talking about will require more standardized interfaces between applications and components. Standards such as iCalendar (see page 4, above) are useful for exchanging contact and scheduling information, and over time as support for the extensible markup language (XML) and its derivatives grows (see Release 1.0, 5-98), it will become easier to map data from one platform onto standard templates.

This month alone we've seen the announcement of:

- The financial products markup language (FpML), designed by J.P. Morgan and PriceWaterhouseCoopers for financial derivatives trading;
- The electronic commerce modeling language (ECML), supported by 12 companies including Visa, MasterCard, American Express, Microsoft and IBM, to standardize and streamline consumer purchasing on the Web; and
- The RosettaNet consortium's EConcert initiative to standardize relationships in the IT supply chain using XML-based frameworks.

These new standards address limited, well-defined tasks, relying on the common substrate of XML and the intelligence of proprietary applications at the edge of the network to facilitate complete services.

We are the Web

Ultimately, all today's work in building Net application frameworks will go to an increasingly commoditized platform. What we will think of as applications will be the intelligence and interfaces on top of that framework. How can I easily establish a profile that says when I travel I want a printed list of incoming messages (voice, fax and email) delivered ahead of me to my hotel room, but when I'm in the office I want everything funneled into my e-mail client? How do I assemble the files I need for a project, regardless of their original format or physical location? From all the available information resources, which adds value to the database record I'm looking at right now? Preferences will vary and will change over time and place. The trick will be to develop interfaces that hide the underlying complexity and adapt to the way people live.

COMING SOON

- *Online content syndication.*
- *Annotation servers.*
- *Broadband video programming.*
- *Business-to-business transaction engines.*
- *How big companies innovate.*
- *The Net in the educational process.*
- *And much more... (If you know of any good examples of the categories listed above, please let us know.)*

Charlene Steele Vaughn, David Knight, **click2send**, (650) 316-3716; fax, (626) 398-8298; cvaughn@click2send.com, dknight@click2send.com
Evan Chrapko, **docSpace**, (888) 810-3627, fax, (650) 854-9123; evanc@doc-space.com
Richard Onyon, **Fusion One**, (408) 399-5620; fax, (408) 399-5650; rick@fusionone.com
Johnny Anderson, Byron Reese, **HotData**, (512) 646-6000; fax, (512) 646-6001; johnny.anderson@hotdata.com, byron.reese@hotdata.com
Bill Nguyen, **Onebox.com**, (650) 356-1205; bill@onebox.com
Ross Bott, **Onebox.com**, (650) 356-1201; fax, (650) 356-0586; bott@onebox.com
Pete Grillo, **PlusFactor Software**, (503) 827-6717; fax, (503) 827-6718; pete@plusfactor.com
Mark Lazar, Mark Drummond, **TimeDance**, (650) 298-0360; fax, (650) 298-0375; mark.lazar@timedance.com and mark.drummond@timedance.com

IETF calendaring and scheduling working group:
www.ietf.org/html.charters/calsch-charter.html

Electronic commerce modeling language:
www.ecml.org

RosettaNet consortium:
www.rosettanet.org

———————————-

Release 1.0 is published monthly except for a combined July/August issue by EDventure Holdings Inc., 104 Fifth Avenue, New York, NY 10011-6901; (212) 924-8800; fax, (212) 924-0240; www.edventure.com. It covers software, the Internet, electronic commerce, convergence, online services, messaging, data networking, groupware, streaming media, enterprise applications, wireless communications, intellectual property and other unpredictable topics. Editor: Esther Dyson (edyson@edventure.com); publisher: Daphne Kis (daphne@edventure.com); managing editor: Kevin Werbach (kevin@edventure.com); office manager: Helen Martin (helen@edventure.com); marketing manager: Joanna Douglas (joanna@edventure.com); systems director: Scott Giering (scott@edventure.com); executive assistant: Trista Schroeder (trista@edventure.com); assistant: Kara Holmstrom (kara@edventure.com).
Copyright 1999, EDventure Holdings Inc. All rights reserved. No material in this publication may be reproduced without written permission; however, we gladly arrange for reprints or bulk purchases. Subscriptions cost $695 per year, $750 overseas.

RELEASE 1.0 CALENDAR

1999

June 22-24	**#PC Expo** - New York, NY. Over 100,000 technology buyers in search of new toys. Sponsored by Miller Freeman; keynote speakers include Bob Herbold and Chuck Geschke. For information, call (800) 829-3976; www.pcexpo.com.
June 22-25	***INET '99** - San Jose, CA. The Internet Society's annual conference. For information e-mail inet99-register@isoc.org; www.isoc.org/inet99/.
June 29-30	**#Broadband Content and Applications Conference** - New York, NY. What if they had a broadband revolution and nobody came? Sponsored by Ziff-Davis. To register call (800) 482-8144; www.zdstudios.com/newworld/bb99/.
July 1-2	**NetMedia 99** - London, UK. European Internet conference for journalists. For information call 44 (171) 477 8036; fax, 44 (171) 477 8563; e-mail conference@city.ac.uk; www.soi.city.ac.uk/netmedia.
July 14-17	**Genetic and Evolutionary Computation Conference** - Orlando, FL. Joint meeting of the 8th International Conference on Genetic Algorithms and the 4th annual Genetic Programming Conference. For information call (650) 328-3123; fax, (650) 321-4457; e-mail gecco@aaai.org; www-illigal.ge.uiuc.edu/gecco/.
July 15-17	**The Wizards of OS: Operating Systems and Social Systems -** Berlin. Examines the meaning of operating systems as the foundation of the contemporary information society. Contact Volker Grassmuck, 49 (30) 313-2795 or 49 (30) 2093-3180; vgrass@rz.hu-berlin.de.
August 24-26	***ICANN Board and Open Meetings** - Santiago, Chile. Come hear about developments in domain-name policy and other Net-platform issues. For info, see www.icann.org.
September 25-27	**#Telecommunications Policy Roundtable Conference** - Alexandria, VA. The premier event for telecom policy wonks. For information, contact Dawn Higgins, (202) 452-9033; e-mail tprc@ei.com; www.si.umich.edu/~prie/tprc/.
September 27-30	**#Fall Voice on the Net** - Atlanta, GA. Pulver.com brings together the Internet telephony community. Call (516) 547-0800; fax, (516) 396-7870; www.pulver.com.
October 24-26	****EDventure's Tenth Annual High-Tech Forum** - Budapest, Hungary. Call Daphne Kis, (212) 924-8800; fax, (212) 924-0240; daphne@edventure.com; www.edventure.com.

** Events Esther plans to attend.*
 # Events Kevin plans to attend.

Lack of a symbol is no indication of lack of merit.
The full, current calendar is available on our Website, www.edventure.com.
Please let us know about other events we should include. -- Joanna Douglas

RELEASE 1.0

SUBSCRIPTION FORM

Please enter my subscription to Release 1.0 at the rate of $695 per year in the U.S. and Canada. Overseas subscriptions are $750, airmail postage included. Payment must be enclosed. Satisfaction guaranteed or your money back.

Name _____

Tite _____

Company _____

Address _____

City _____ State _____ Zip _____

Country _____

Telephone _____ Fax _____

E-mail _____ URL _____

☐ Check enclosed

☐ Charge my

☐ American Express ☐ Master Card ☐ Visa

Card Number _____ Expiration Date _____

Name and Billing Address _____

Signature _____

☐ Please send me information on your multiple copy rate.

Please fill in the information above and send to:

EDventure Holdings Inc.
104 Fifth Avenue, 20th Floor
New York, NY 10011

If you have any questions, please contact us at 1 (212) 924-8800;
fax 1 (212) 924-0240; e-mail us@edventure.com; www.edventure.com.

Daphne Kis
Publisher